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ORIGINAL ARTICLES

RESULTS OF DEEP ROENTGEN-RAY TREATMENT IN 258 CASES
OF MALIGNANT TUMORS.

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DURING the past four years we have had the opportunity of studying the action of roentgen rays with and without other adjuvant methods in a series of 658 cases of malignant tumors and allied conditions referred to the roentgen department of the Memorial Hospital. In summarizing these results, and as a basis for this paper, we have selected 258 cases in all of which the microscopic diagnosis and clinical data were established beyond question. Outside of the cases of Hodgkin's disease it will be seen that the cases treated represent what is commonly recognized as true cancer, and therefore the study of these cases will serve to indicate what results we can logically expect to attain in treating this class of cases with the roentgen rays at the present time. *No endeavor has been made to feature the few cases that responded unusually well to treatment*, and we have eliminated from our lists all cases in which the diagnosis was not verified by competent microscopic examination, all cases in which the clinical data and subsequent histories were incomplete, and cases that discontinued treatment, etc.; also all cases of uterine carcinoma as they will be reported by the gynecological department. The cases were classified as follows:

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EPITHELIAL TISSUE.

	Total.	Improved.	Unimproved.	P. I.—S. D.	Improved; still under treatment.	Dead.
1. Basal-cell epithelioma	16	16	0	0	16	0
2. Squamous-cell epithelioma	38	5	33	4	1	37
3. Alveolar and scirrus carcinoma of breast	59	32	27	18	14	45
4. Carcinoma of testis (teratoid)	5	5	..	3	..	5
5. " of neck (branchial clefts)	7	..	7	..	..	7
6. " of esophagus	1	..	1	..	..	1
7. " of stomach	2	..	2	..	..	2
8. " of intestines (carcinosis)	4	..	4	..	..	4
9. " of colon	4	1	3	1	..	4
10. " of rectum	7	..	7	..	..	7
11. " of thyroid	5	4	2	3	1	5
12. " of lung	3	1	2	1	..	3
13. " of tonsil	1	..	1	..	..	1
14. " of ovary	2	1	1	..	1	1
15. " of larynx	6	..	6	..	..	6
16. " of gall-bladder	1	1	..	1	..	1
17. Melanoma	4	1	3	1	..	4

CONNECTIVE TISSUE.

18. Sarcoma, mixed, myeloid, spindle, etc.	38	6	32	4	2	36
19. Sarcoma, melano	4	1	3	1	..	4

LYMPHATIC TISSUE.

20. Sarcoma, lympho	21	15	6	8	7	14
21. Pseudo leukemia	12	10	2	3	7	5
22. Lymphatic leukemia, chronic	4	3	1	2	1	2
23. Splenomyelogenous leukemia	2	2	..	2	..	2
24. Lymphoma	1	1	..	1	..	..
25. Thymoma	1	1	..	..	1	..

OTHER TISSUES.

26. Mixed tumors (parotid)	1	..	1	..	..	1
27. Endothelioma	1	..	1	..	..	1
28. Glioma retina	1	..	1	..	..	..
29. Lipoma recurrent	1	1	..	..	..	..
30. Rhabdomyo sarcoma	1	..	1	..	..	1
31. Hypernephroma	1	..	1	..	..	1
32. Adamantoma	1	..	1	..	..	..
33. Embryonal carcinoma	2	1	..	1	1	1
	258	108	150	54	54	203

EXPLANATION OF CLASSIFICATION. In most of our cases "improved" means a diminution in the size of the lesions, with a diminution of the symptoms. If the lesions were ulcerative in character there were evidences of healing best shown in early cases of basal-cell epithelioma, in which the healing was uniformly prompt, progressive, and complete, except in late and very extensive lesions. If the lesions were subcutaneous or metastatic, "improved" means that they diminish in size,

Pain was very strikingly relieved in many of the cases; discharge diminished in quantity and odor. If the patient's symptoms improved, but the lesions did not show improvement, the case was not considered improved.

"Unimproved" means that the patient's lesions or symptoms or both were not improved and that the lesions steadily progressed despite treatment.

Some of the cases showed such marked improvement under treatment at first that although they subsequently died it was deemed important to call attention to this class of cases by tabulating them under the heading of "primarily improved, subsequently died." Our experience has led us to expect certain cases to do very well under treatment at first and raise great hopes of recovery in the patient and the therapist. Such cases have frequently been reported in the literature during this stage of improvement, and not uncommonly the patients have relapsed and died by the time the reports have been published. Some cases are improved but still under treatment, so that their ultimate results are not known. These are classified in the column "improved, still under treatment."

APPARATUS AND TECHNIC. The apparatus and technic used in administering the roentgen-ray dosage consists of a high-tension transformer capable of giving sparks 10 inches long between the poles of the spark gap, while the Coolidge tube is in operation (this high-tension transformer is run by the 220 volt alternating current) broad focussed Coolidge tubes regulated so as to back up a 10-inch parallel spark gap while in operation and passing 7 milliamperes of current through the tube. The focus skin distance was 6 to 8 inches, the rays were filtered through 3 mm. of aluminum in the early treatments and through 4 mm. of aluminum later in the series. The dosage was measured on the skin by means of Corbett's modification of the Lovibund tintometer. Our average skin dose is 3 B Sahoreaud, equivalent to 15 Holtzknecht or 30 Kienbock units to each area treated. The average time required to obtain this dose was 3 to 4 minutes.

The roentgen rays were applied through portals varying from 3 to 5 cm. square, using the cross-fire method of traversing the diseased tissues at many angles. The maximum dose for skin toleration was administered as shown by the tintometer readings and verified by the erythemas produced. The dosage was never repeated over a given area at intervals of less than two weeks. We found that we could treat 2 to 3 portals at a sitting without causing nausea in our patients, but treating a greater number of portals always caused depression and nausea even when the patients were under alkaline treatment to overcome acidosis. When treating directly over the stomach the patients were prone to become extremely nauseated. To illustrate the number of portals used, let us take for example a

case of carcinoma of the breast, in which we would select the following portals:

Anterior chest, 2 to 4 portals.

Posterior chest, 2 to 4 portals.

Axilla and axillary line, 1 to 2 portals.

Supraclavicular fossa and neck, 1 to 2 portals.

Total, 6 to 12 portals over each side of the thorax.

In selected cases both mammary regions were treated through these multiple portals. Attempts were made to increase the skin dosage tolerance by various methods of dehematizing the skin



FIG. 1.—Before treatment.



FIG. 2.—After treatment.

FIGS. 1 and 2.—Microscopic diagnosis: basai epithelioma. Duration, fourteen year. Previous treatments: local applications of ointments, pastes, caustics, curettement, high-frequency current, etc. Occupation: farmer. Preëpithelial keratoses are scattered over face, neck, and hands. Two treatments improved the patient so much that he discontinued treatments for seven months, believing himself well. On his return it required seven more treatments over the nose to control the condition and eight treatments to clear the face, neck, and hands of the keratoses.

through pressure, ice-bags, and adrenalin injections, but without sufficient success to make us feel warranted in continuing them. Attempts were also made to increase the number of secondary rays generated in the tumors by injecting suspensions of heavy metals and also by producing hyperemia within the tumors. These attempts were not attended with any noteworthy success. The application of heat by diathermy in conjunction with the roentgen rays was tried, and it appears to be a synergist to the roentgen-ray treatment in superficial cases and in those cases in which the heat acted practically as a removal by cautery. When sloughing obtained, however, in these cases the wounds were sluggish in healing.

INTERPRETATION OF THE THERAPEUTIC RESULTS. *Basal-cell Epithelioma.* Except in old advanced cases the results in this type of lesion are uniformly good, all 16 cases responding promptly, the lesions healing in from three to twelve weeks, and with one exception have remained well to date. With proper microscopic diagnosis other more painful methods are unnecessary.

Squamous-cell Epithelioma. The bad results in this class of cases are in marked contrast to the good results obtained in basal-cell epithelioma. The one improved case shown in the table of cases was treated with the roentgen rays combined with diathermic coagulation. He was symptomatically well for six months and then showed signs of local recurrence. He was again treated with massive doses of roentgen rays locally and roentgen rays cross-fired through the cervical lymph nodes. The condition seems to be under control at the present time, but the prognosis is dubious. This is a good illustration of the course of squamous epithelioma under treatment.

Carcinoma of the Breast. A majority of these cases show a primary improvement evidenced by diminution in the size of the tumors, both primary and metastatic, with frequent disappearance of the latter. Diminution in pain, discharge and fetor are also notable. Metastases are always more amenable to roentgen therapy than primary growths, and the earlier they are treated after their appearance the more evident this becomes. Efficient treatment of early metastases may cause a complete clinical disappearance of cancer tissue. In cases in which the therapeutic effect of the ray has not entirely succeeded, careful search will usually reveal small groups of viable cells, accounting thereby for such local recurrences as do occur. Besides the primary lethal effect of the ray on the malignant cells we have to do in all probability with a second and very important factor in determining the success or failure of our method of treatment. That is the degree in which the stroma has gone in supplying the necessary circulation for the cells of the growth, for where these cells have time to be provided with abundant stroma, containing a rich blood supply, it seems more difficult to eradicate the cancer cells entirely. It is for this reason, we believe, that metastases are more influenced than primary growths and why early metastases can be obliterated entirely. We believe that the greatest emphasis should be laid on the value of the preoperative and postoperative raying in all cases, in which surgical removal is contemplated, because the surgeon can never feel assured that he has not left behind isolated cells. And if these cells are to be attacked successfully, the time to do it is, we believe, when they are not connected organically with the circulation of the host.

Lymphosarcoma. This class of cases gives us our most brilliant primary results. In many cases the tumors melt away and there is a notable restoration of health and sense of well-being. Unfortu-

nately in our experience they all relapse and the process proceeds despite all treatment.

Lymphoid Group. In pseudoleukemia, chronic lymphatic leukemia, splenomyelogenous leukemia, lymphoma we see the same result as in lymphosarcoma; primary improvement with disappearance of the tumors is the rule. Ultimately these cases relapse and die. In thymoma, however, we have had good results which have lasted to date. What the ultimate result will be we cannot at present state, but in this one group we are optimistic.

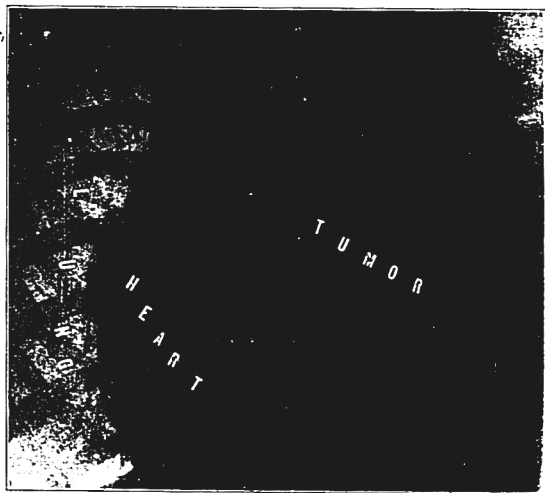


FIG. 3.—Embryonal carcinoma of the left lung before treatment, January 12, 1915.

Carcinoma of the Viscera. All failed to show noteworthy improvement except carcinoma of the thyroid and adenocarcinoma of the ovary. One case of large inoperable adenocarcinoma of the ovary involving the omentum and viscera was given three times our maximum dose of roentgen rays through an open wound and in the abdomen. All evidences of the tumor disappeared subsequent to this for a period of nine months. The patient then returned to the hospital in a feeble condition with evidence of widespread pelvic adhesions. She was given as much roentgen-ray treatment as her feeble condition warranted. She finally died in a very much emaciated condition and with symptoms of obstruction of the bowels. At autopsy there were no evidence of any carcinoma in the pelvis

whatever; all had disappeared and been replaced by connective tissue. There were extensive metastases in the liver and spleen.

Embryonal Carcinoma. In our series we had 2 cases of embryonal carcinoma. They showed very marked initial improvement. One relapsed despite all treatment; the other is still in the initial improvement stage.



FIG. 4.—Embryonal carcinoma of left lung after treatment, May 14, 1915.

THERAPEUTIC RESULTS BASED ON PHYSIOLOGICAL ACTION OF THE ROENTGEN RAYS. The improvements obtained in certain classes of cases are such as might be expected when one considers the physiological action of the roentgen ray.^{1 2} It has been shown that the deep tissues of the body which are most susceptible to roentgen rays are the lymphoid tissues of the spleen, lymph glands and follicles, thymus gland, the spermatogenous epithelium of the testis, the Graafian follicles of the ovary, endothelial cells, embryonal cells, and the nucleus of cells, especially those in an active state of division.

Based on these physiological actions it is logical to expect that we would find the greatest therapeutic effects of the roentgen rays in diseases causing lymphatic, testicular, and ovarian tumors and tumors made up of embryonal cells, and this is borne out in experience as we get most effect in lymphosarcoma, the leukemias, embryonal carcinoma, carcinoma testis of teratoid origin, and adenocarcinoma of the ovary. In this series of cases we were fortunate in being able to observe 33 cases of lymphosarcoma and 18 cases of Hodgkin's disease. These cases will be published in detail subsequently.

CONCLUSIONS. From a study of these cases we are justified in drawing the following conclusions in regard to the value of roentgen rays in cancer:

1. Roentgen rays give excellent therapeutic results in basal-cell epithelioma.

2. They ameliorate cases of carcinoma of the breast, ovary, and testis, tumors lymphatic structures especially when these tumors are made up of cells of an embryonal type.

3. While we cannot successfully maintain that the roentgen rays have yet proved to be a cure in cancer it is worthy of note that these rays as well as those of radium applied with removal when possible produce more uniform improvements in cancer than any other agents heretofore known, and the use of these agents in cancer is established until some effectual constitutional treatment for cancer is found.

4. Pending the discovery of some effectual constitutional treatment every effort should be made to increase the ameliorating effects of the radio-active methods.

5. Surgery should not ignore the benefits of these methods in the treatment of cancer, particularly in the postoperative raying and treatment against metastases.

6. Most of our improved cases eventually relapsed, and while their lives were prolonged and made more comfortable by the roentgen-ray treatment they eventually died of the disease.

7. In some instances these ameliorating effects were very striking and deserve particular attention in the hope that we may eventually discover means of making these ameliorations more lasting and even permanent.

CASE HISTORIES. *Results of Deep Roentgen-ray Treatments in 258 Cases of Malignant Tumors.*

CASE II.—Mrs. Mc. K.; aged forty-five years.

Microscopic Diagnosis. Alveolar carcinoma breast.

Chief Complaint. Recurrent tumors of breast and enlarged glands above the clavicle.

Family History. One grandparent, mother, and one sister had cancers.

Personal History. Patient was operated on for ectopic gestation in 1907. Had a hysterectomy for myoma in 1910.

Present Illness. Onset in November, 1913, with the appearance of two nodules in the right breast. No pain. Nutrition good.

December, 1912. Radical amputation of right breast and dissection of axillary glands. (Dr. C. H. Peck, Roosevelt Hospital.)

Pathological Report. "Section of the tumor mass is composed entirely of epithelial cells, packed away together and lobulated, with dense fibrous connective-tissue bands containing numerous small round cells, a few polynuclears, moderately congested bloodvessels, and some fat. The fibrous stroma is slight, the cellular elements predominating. Mitoses are present. Section of the smaller mass shows groups of these cells having the same characteristics invading the breast tissue. Section from the axillary glands shows a thickened capsule and trabeculae rather densely infiltrated with small round cells and containing a few congested bloodvessels, and the lymphoid tissue is almost entirely replaced by invading groups of epithelial cells having the same general characteristics as the original tumor. Mitoses are numerous." (Baldwin Mann, pathologist.)

Received postoperative roentgen-ray treatments for one month.

March, 1913. Recurrences developed along the healed scar. Enlarged glands appeared above the clavicle and in the epigastric region.

November 10. Massive deep roentgen therapy begun, treatments being administered to all sides of the chest, axillae, and neck. 510 X (Kienboch) units being administered with water-cooled tubes and 1290 X (Kienboch) units being administered with Coolidge tubes. Total 1800 X (Kienboch) units. One persistent nodule in the scar about 4 cm. long was treated with radium, total 98 millicurie hours (Dr. H. H. Janeway) filtered through 1 mm. of lead administered in eight treatments. Under this treatment all nodules disappeared and the patient was symptom-free until October 20, 1915 (a period of nearly two years). At this time she complained of pain in her back (lumbar region). Roentgen-ray examination showed no evidence of bone metastases. The pain was very much relieved by roentgen treatments.

December, 1915. Patient developed general metastases all over her body. Large masses appeared in the left breast, which was enormous and had a hog-skin appearance. The left axilla was involved. Pain developed in chest and back. The patient was evidently progressing into a stage of general carcinosis. On account of the fact that the gamma rays of radium are more penetrating than the hardest roentgen rays generated from a Coolidge tube it was decided to use large quantities of radium emanations, heavily filtered, under Dr. H. H. Janeway's direction. Between January, 1915, and July, 1916, she received a total of 51,908 millicurie hours of radium, using distance and various metal filters. Under this treatment the tumors diminished very greatly in size and changed from edematous swollen masses to hard contracted masses. The left breast became adherent

to the chest wall. The patient's symptoms were greatly improved for a time; later she gradually failed, but is still alive at the present time.

The important points in this case are the strong family history of cancer; the well-developed and excellent nutrition of the patient, the development of a malignant type of cancer of the breast, as shown by its clinical course and morphology. The radical operation within one month of the appearance of the tumor by a very competent surgeon under ideal hospital conditions; the recurrence of the growth with palpable supraclavicular and epigastric metastases within four months after the operation, rendering her in a condition hopeless for further operative intervention; complete relief of symptoms and palpable evidences of disease under roentgen-ray and radium treatment for two years subsequent to the development of this hopeless condition; after which she developed a condition of carcinosis which was ameliorated by enormous doses of radium emanation. The analgesic and alterative actions of roentgen rays and radium. The patient is still alive four years subsequent to the onset of her original disease and three years eight months after the development of hopeless metastases.

CASE III.—C. S., male; aged forty years.

Microscopic Diagnosis. Lymphosarcoma.

Chief Complaint. Recurrence of tumor of face on the left side.

Duration. Ten years.

Family and Personal History. Negative.

Present Illness. Began ten years ago with the appearance of a nodule on left side of face close to the ear. He was operated on several times. A year ago the patient was treated with mixed toxins. The tumor retrogressed. The patient continued to be treated with toxins while at home, but with no permanent improvement.

Physical Examination. The patient is a well-nourished man in middle adult life, who has a tumor of the left side of the face. His jaw is limited in motion, so that the teeth can only be parted one-third inch. His tonsils and pharynx we were unable to examine. There is facial paralysis of the left side of the face. The region of the left ear and all its surroundings show a hard prominence, which is red, and especially so behind the ear. The external canal of the ear presents an ulcerated area covered with a purulent discharge. The scars of previous operations are seen beginning from the lobe of the ear and ending about $3\frac{1}{2}$ inches below. The lymph nodes are not enlarged. The abdomen is soft and no masses felt. No edema of the legs. Patient had been under treatment with mixed toxins for a period of about two years, but the growth did not diminish any so it was then decided to add roentgen-ray treatments.

November 20, 1913. Roentgen-ray treatments were begun, and in all he received seven massive treatments. After the third treatment (December 15) the tumor began to retrogress very markedly

and by the end of January, 1914, the entire mass was gone. Patient left the hospital in a fairly good condition. The growth did not recur. The patient died six months later from nephritis.

Carcinoma Testis of Teratoid Origin. This class of cases also gives us uniform initial improvement, followed by ultimate relapses. In our series we had 5 cases; all improved; all died.

CASE IV.—Male; aged twenty-nine years.

Microscopic Diagnosis. Carcinoma testis of teratoid origin with abdominal metastases.

Chief Complaint. Tumors in abdomen particularly in the splenic region.

Personal and Family History. Negative.

February, 1914, he first noticed an enlargement of the left testicle. In March this tumor was removed and the patient was symptom-free until July, when he had a sudden onset of abdominal pain, and on examination a tumor mass was discovered in the left lower abdominal quadrant. The patient was then treated until March, 1915, by Dr. J. W. Vaughn's (Detroit) serum method, under which the tumor grew smaller for a time, but subsequently relapsed.

Physical Examination. A well-nourished young man with no evidence of poor health except a hard mass in the left side of the epigastrium about the size of an orange. Its outline is regular and it lies for the most part under the left rectus muscle. It is not tender on deep palpation. Liver is not enlarged. No ascites. Lymph nodes in groin slightly enlarged. Wassermann reaction negative. He was placed on several special treatments by Dr. S. P. Beebe, without any apparent change in the patient's condition.

March 19 he was given a treatment over the abdominal tumor, after which it was noticeably diminished in size. The treatments were repeated over the enlarged glands in the groin, after which they disappeared. The special treatments were continued and the roentgen-ray treatments stopped, followed by prompt recurrences of the enlarged glands in the groin. Roentgen-ray treatments were resumed at the patient's request and the tumors again disappeared.

May 29. Roentgen-ray examination of the chest showed metastases in the hila of both lungs. The patient received a total of 21 massive roentgen treatments over the abdominal, inguinal, and mediastinal lymph nodes. These enlargements were all reduced under this treatment and were held in abeyance up to July, when the patient discontinued treatment. The tumor masses subsequently recurred and the patient died of exhaustion.

Summary. Case of carcinoma testis of teratoid origin. Primary tumor removed within a month of the onset. Metastases developed within four months after operation. The generalized metastases were treated eight months by Vaughn's serum method, with primary improvement and subsequent relapse, he was then treated by a combination of special treatments, including autolysin and roentgen-

ray treatments covering a period of five months; it was noticeable that the size of the tumor diminished after each roentgen-ray treatment and at times were made to disappear and when the roentgen rays were omitted the tumors promptly reappeared; it is therefore logical to assume that the ameliorations were due directly to the roentgen-ray treatments. The patient subsequently died of exhaustion. This was the first case of this class of tumor which we had treated and before we knew of the efficacy of roentgen rays.

CASE V.—E. W.: female; aged seventeen years. Admitted to Memorial Hospital, January 10, 1915.

Chief Complaint. Swelling on the left side of the chest. Shortness of breath.

Present History. Six months ago (July, 1914) the patient began to have sharp pains around her heart, in the left axilla, and in her back. The pain lasted only a few seconds at a time. About the same time she became short of breath. She could not walk a block without resting two or three times. Six weeks ago she first noticed a small swelling near the left axilla. The swelling has increased in size very little since she first noticed it. Now she occasionally has pain in the swelling in her back. She has had several night-sweats. No cough. Has expectorated a small amount of whitish material. Nose bleeds occasionally. December 26 she was tapped, 1500 c.c. of fluid being obtained. She was admitted to the Jewish Hospital two weeks ago and was tapped again one week ago, 1500 c.c. being obtained.

Past History. Two years ago she had a cough which lasted a month.

Family History. Negative.

Physical Examination. The patient is a moderately well-developed and well-nourished girl, aged seventeen years. Mucous membranes rather pale. Skin normal. On the left side of the thorax, in the anterior axillary line, just below the lower edge of the pectoralis major muscle and partially covered by that muscle, there is a hard mass 10 cm. in diameter. The mass is circular in shape, has a smooth surface, and is firmly fixed to the chest wall. Skin over the mass normal in appearance and movable. Left chest appears larger than the right. Intercostal spaces on the left side bulging. Left chest immobile on respiration. Right chest moves normally.

Palpation. Tactile fremitus present on the right side and absent on the left side.

Percussion. Flatness over the whole left chest, both anterior and posterior. Normal resonance on right side.

Auscultation. Breath sounds distant over the whole left chest. Somewhat tubular in character in the lower part. On the right side breath sounds are normal. No rales or friction sounds heard.

Heart. Apex beat cannot be seen or palpated. On percussion the cardiac dullness extends one inch to the right of the sternum. Left

border of heart not made out. Heart sounds indistinct, except at the right border of the sternum. Regular and of good quality. Pulse rate 90 and of good force.

Abdomen. No masses, tenderness, or rigidity. Liver cannot be palpated. On percussion the liver dullness extends almost to the umbilicus. Spleen and kidneys cannot be palpated.

Summary. A moderately well-nourished girl, aged seventeen years. Hard, movable tumor, on anterior chest wall at the lower border of the left pectoralis major muscle. Flatness over the whole left chest with distant breath sounds. Heart displaced to the right. Liver enlarged. Palpable lymph nodes in groins. Roentgen-ray examination shows that the entire left side of the thorax is filled with a mass of tumor tissue with some effusion. Chest aspirated. 1000 c.c. of bloody fluid obtained. Tissue was removed under local anesthesia, on which the following pathological report was made:

"Tumor of axilla. The tumor is a malignant growth composed of small round and polyhedral cells. The structure is peculiar. There are many small arterioles with thickened or hyaline walls to which are attached the small tumor cells, as in perithelioma. Between these units are diffuse masses of tumor cells. The tumor cells resemble lymphocytes, but show a polyhedral tendency which suggests an epithelial or endothelial origin. There are many mitoses. The tumor may be a lymphosarcoma, or a malignant embryonal growth from some glandular organ."

Massive roentgen-ray treatments were begun, followed by noticeable improvement within ten days. The treatments were continued and the external tumor disappeared. Roentgen-ray examination showed pronounced diminution in the size of the intrathoracic tumor. Heart returned to its normal position. Lung relations on the right side have resumed their normal place. Patient discharged to the out-patient department February 27.

Condition. General health has improved. She has gained weight during the past three weeks. Still complains of sharp pains in the lower part of the left chest.

Physical Examination. Mass in left axilla almost disappeared. Moderate resonance over anterior and posterior part of left chest. Impaired resonance in left axilla and at base of lung. Breath sounds normal except over the dull areas where they are not heard distinctly. No rales or friction sounds heard. Heart seems to be in normal condition. Patient's condition continued to improve and she became symptom-free, remaining so until September 10, when she was readmitted because of shortness of breath. Roentgen-ray examination of the chest showed the tumor growing rapidly. Her general condition became gradually weaker and dullness developed over the entire left chest. Cardiac impulse displaced to right of sternum in the third interspace. Abdomen distended and tympan-

itic, and there was apparent paralysis of both legs. November 13 the patient died. No autopsy was permitted.

Summary: Duration: Fourteen months previous to treatment.

Microscopic diagnosis: embryonal carcinoma of the chest of unknown origin. (A type of tumor which is unique in medical literature.) A large tumor mass almost filled the left chest. A hard movable tumor mass presented on chest wall. No metastases demonstrable. Marked dyspnea. Patient received 28 massive roentgen treatments (840X) between January 22, 1915, and August 1, 1915, during which time she became symptom-free and much improved in health. The external tumor disappeared; the intrathoracic tumor diminished as shown in the illustrations. One month later the patient's symptoms suddenly returned and progressed despite all forms of treatment. Patient died of exhaustion.

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SYPHILITIC AORTITIS.¹

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THE development of internal lesions in latent syphilis is attended by such vague indefinite clinical manifestations as to render diagnosis

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